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The judicial system and economic development across EU Member States

Vincenzo Bove and Elia Leandro

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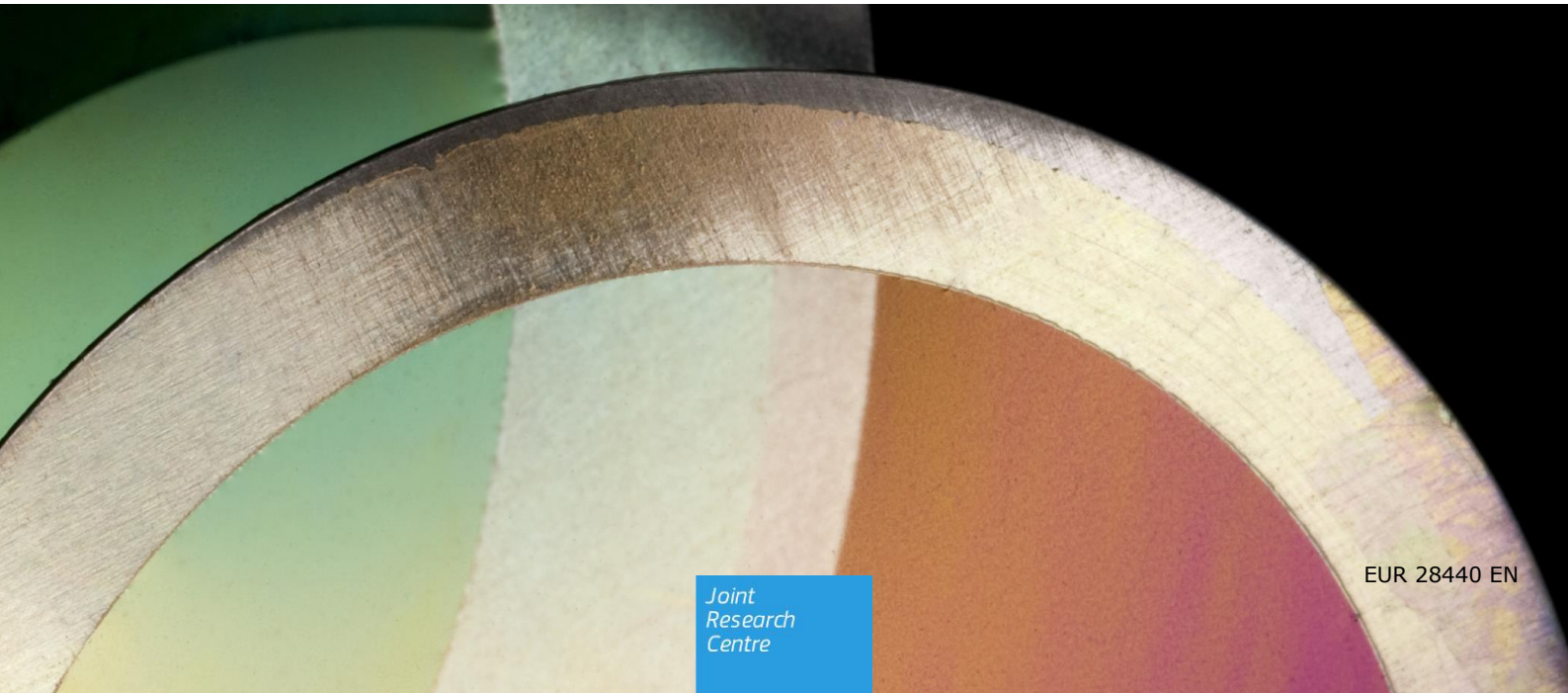

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The judicial system and economic development across EU Member States

Vincenzo Bove[a] and Leandro Elia[b]

Abstract

This analysis presents a number of correlations between EU Member States (MS) judicial systems and indicators of firm performance. To measure the functioning of the justice systems, we use indicators of efficiency, quality and independence. To measure economic development, business statistics such as value added, turnover, value added per worker and the number of enterprises are employed. Results show some strong correlations between the length of court proceedings - a proxy for efficiency of the justice system - and MS firm performance. At the same time, however, the correlations between economic performances and some of the available measures capturing more complex facets of an effective justice system, namely quality and independence, are less pronounced and robust. Policy implications should be drawn with caution due to the small sample size and the short time period available. Moreover, although our findings reveal interesting relations, the evidence is best described as descriptive rather than causal.

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[b]European Commission, DG Joint Research Centre, Unit I1. Modelling, Indicators and Impact Evaluation, Competence Centre on Microeconomic Evaluation (CC-ME), TP 361, Via E. Fermi 2749, I-21027, Ispra (Va), ITALY; email: leandro.elia@jrc.ec.europa.eu. The present work was written when Vincenzo Bove was visiting the JRC. We are grateful to Corinna Ghirelli, Sven Langedijk, Gianluca Mazzarella, Elena Meroni, Paolo Paruolo, Giulia Santangelo for their helpful comments. The responsibility for any remaining errors or omissions is our own.

1 Introduction

The present study aims at exploring whether a nation?s judicial system affects its levels of economic development. The main elements of an effective justice system are its efficiency, quality and independence. To effectively assess the functioning of the judiciary, there are a number of indicators that can be used and that fall into six main areas: efficiency, quality and independence. At the same time, the state of the economy can be captured by indicators of value added, turnover, value added per worker - a proxy for labor productivity - and the number of enterprises. Results presented in this analysis should not be interpreted as establishing causal relationships, because the economic outcomes we investigate are undoubtedly caused by many other factors that cannot be observed, and therefore included in the analysis. Instead, our results offer a broad and informative range of correlation patterns. If anything, the analyses presented below can be helpful in steering future research efforts that intend to identify causal mechanisms.

2 Data

Data on the justice systems are taken from the "2016 EU Justice Scoreboard" published by the DG JUST. We use a long time series to explore whether the association between the judiciary and business performances could be explained by the implementation of reformprocesses within thenational justicesystems. We select a sub-set of indicators for each of the three areas that identify an effective justice system, i.e. efficiency, quality and independence. The selection of indicators has also been dictated by the availability of time series. Efficiency of a justice system is measured by an indicator of the time needed to resolve litigious civil and commercial cases and the number of administrative pending cases. Quality of the judiciary is captured by per capita total spending on law courts, the total number of judges and the number of quality standards that MS adopted to monitor and assess the justice system. Independence is measured by companies' perception of judicial independence. Data on the economy of member states are taken from the Structural Business Statistics, a database provided by Eurostat. In

particular, the present study focus on indicators of firm performance, such as value added, turnover, labour productivity measured as value added per worker, and number of enterprises. For these variables, we use the average annual compound rate for the period 2010-14. We make sure that data on economic performances and data on the judiciary systems cover the same time window.

3 Empirical models

To estimate the effects of the judiciary on firm performance the following linear regression model is used:

$$Y_i = \alpha + \beta JUST_{i,2010} + \gamma Y_{i,2010} + \varepsilon_i \tag{1}$$

where Y_i is the average annual growth rate of real value added (real turnover, real value added per worker as a proxy for labour productivity, number of enterprises) for country i. We take the average over the period 2010-2014. $Y_{i,2010}$ is the beginning-of-period real value added (real turnover, real value added per worker, number of enterprises) and is meant to capture initial differences that can influence subsequent variables' growth rate. $JUST_{i,2010}$ is the level of judiciary functioning in 2010, the starting year for our analysis. As mentioned above, the multi-faceted nature of judicial performance and the efficiency of the justice system is captured by the following indicators:

- the time needed to resolve litigious civil and commercial cases (in days);
- the number of litigious civil and commercial pending cases (per 100 inhabitants).

Moreover, to capture the quality domain of the justice system the study uses

- the per capita total expenditure on law courts;
- the number of judges (per 100K inhabitants);
- the number of quality standard.

Finally, to gauge independence of the court and judges the study uses:

- the businesses' survey on perception of judicial independence.

To sum up, four linear regressions for each of the above mentioned indicators of justice systems' functioning are estimated.

All the independent variables are transformed into logs to scale down the variance and reduce the effect of outliers. In so doing, the coefficients can be interpreted as a semi-elasticity. Due to the small sample size, we need to explore the effect of each indicator for the justice system separately. However, an additional model is also provided, where the three indicators, one for each category (efficiency, quality and independence) are included simultaneously. Indicators considered in this specification were chosen so as to safeguard sample size.

Yet, additional variables that might explain some or all the correlation between the output variable and the indicator of justice cannot be included. Hence, results have to be interpreted with caution. Estimates of regression model (1) might in part capture the effects of changes in the judiciary occurred during the period 2010-14. This would be the case if countries with issues in the functioning of their justice system had implemented relatively more incisive reforms. As a consequence, the justice system has level effects on the output variable of interest. To explore this possibility, the regression model (1) is augmented with the following variable $\Delta JUST_i = JUST_{i,2014} - JUST_{i,2010}$, that is increasing (decreasing) in the level of justice system functioning.

4 Results

Tables (1)-(4) report the results obtained from model (1). Figures (1)-(8) give a visual interpretation of the regression results. More precisely, Figures (1-8) display the correlations between the dependent (ΔY_i) and independent variables ($JUST_{i,2010}$) while removing the influence of the beginning-of-period variable ($Y_{i,2010}$). The superimposed red line is the prediction for ΔY_i from the linear regression (1). The sign of coefficients are all consistent with the expectations, albeit they are statistically different from zero only in very few cases. For instance, if we look at the effect of the length of proceedings, we find that a 1% increase in efficiency is

predicted to boost the growth rate of value added by 0.03% (Table 1), to increase the growth rate of turnover by 0.02% (Table 2), and to increase the growth rate of the number of firms by 0.04%. Similar findings are obtained when the number of pending cases is the indicator for efficiency. Yet, this negative association seems to remain robust to the inclusion of all judiciary performance indicators (see models in columns viii).

Another important factor that appears to influence firm performance is independence. In particular, businesses' perception of judicial independence is significantly correlated with the growth rate of turnover and productivity, while it seems not statistically associated with the growth rate of number of enterprises and of value added. A 1% increase in the percentage of companies that perceived the justice system as independent increments average growth rate of turnover by 0.05% and that of productivity by 0.05%.

Since countries with challenges in the functioning of their justice system are more likely to implement stronger justice reforms, and this could partly drive the statistical association between the justice system and firm performance, the regression models have been re-estimated including the variable $\Delta JUST_i$. This variable is meant to capture changes occurred in the judiciary because of implementation of national reforms and remove its influence in the relationship of interest. This approach was used only for the models wherein time varying justice indicators were factored in. The results are reported in Tables (5)-(7). There are only very few results that remain robust to this check. For instance, while the coefficient of perceived independence remains robust to all specifications, the length of proceedings is significant only for the growth rate of the number of companies. Moreover, it seems there is a positive and statistically significant effect of increasing the total expenditure on law courts, , which lifts all indicators of business performance. However, one cannot exclude the possibility that this effect is due to the overall increase in expenditure in response to the economic downturn.

5 Conclusion

This analysis explored whether a well-functioning judicial system is associated with economic development. By using data from the "2016 EU Justice Scoreboard" and Structural Business Statistics, the study finds strong statistically significant correlation between the length of proceedings - a proxy for efficiency of the judiciary - and MS firm performance. On the other hand, results for quality and independence of the judiciary are mixed. In particular, the study cannot reject the hypothesis of no correlation between total spending on law courts, the number of judges, the number of quality standard and firm performance indicators. In addition, a weak correlation (at conventional levels of statistical significance) is found between companies' perceived independence of the justice system and economic development.

Our findings are subject to several caveats. First, one may be concerned with the small sample size, which considerably hinders the confidence in our estimates by introducing bias in the estimates or by producing spurious correlations. Small sample size also prevents generalization of the results. Second, our model does not account for important factors that are difficult to observe or quantify and that can drive both economic performances as well as the quality of institutions, including the judiciary system. In addition, we confined our study to country-level effects, rather than on the impact of the judicial system on local organizations. To dig deeper into the relationship between the judicial system and economic development, more effort should be devoted to the integration of court-level data with company-level information on business characteristics.

Table 1: Indicators of the functioning of justice system and the average growth rate (2010-14) of value added

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Value added$_{(2010)}$	-1.14**	-0.22	-0.72	-0.81	-1.14**	-0.85	-0.30	1.13**
	(0.504)	(0.57)	(0.42)	(0.64)	(0.40)	(0.55)	(0.62)	(0.43)
Efficiency								
Length of proceedings	-3.34**							-3.40**
	(1.31)							(1.54)
Pending cases		-1.71*						
		(0.81)						
Quality								
Total spending			-0.20					-0.23
			(1.20)					(1.43)
# of judges				-0.58				
				(1.57)				
# of standard					-1.26			
					(1.42)			
Independence								
Perceived independence (WEF)						3.53		4.33
						(2.49)		(2.94)
R^2	0.48	0.38	0.12	0.13	0.35	0.19	0.35	0.56
Countries	16	14	18	18	17	18	17	16

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Indicators of the functioning of justice system and the average growth rate (2010-14) of turnover

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Turnover$_{(2010)}$	-0.81*	0.00	-0.56	-0.49	-0.82**	-0.59	-0.15	-0.92**
	(0.44)	(0.38)	(0.41)	(0.51)	(0.33)	(0.47)	(0.53)	(0.36)
Efficiency								
Length of proceedings	-2.41**							-2.65**
	(1.05)							(1.16)
Pending cases		-1.57**						
		(0.56)						
Quality								
Total spending			0.65					0.33
			(1.20)					(1.11)
# of judges				-0.62				
				(1.39)				
# of standard					-2.55			
					(1.52)			
Independence								
Perceived independence (WEF)						5.14**		5.64**
						(2.05)		(2.34)
R^2	0.322	0.402	0.077	0.072	0.284	0.268	0.280	0.562
Countries	16	14	18	18	17	18	17	16

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Indicators of the functioning of justice system and the average growth rate (2010-14) of productivity

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Productivity$_{(2010)}$	-0.75	-0.76	-1.23	-0.86	-0.99	-2.59**	-0.48	-4.60**
	(0.71)	(0.84)	(1.31)	(0.88)	(1.04)	(0.88)	(0.53)	(1.75)
EFFICIENCY								
Length of proceedings	-0.64							-0.47
	(0.98)							(0.72)
Pending cases		-0.71**						
		(0.29)						
QUALITY								
Total spending			0.50					1.72
			(1.32)					(1.13)
# of judges				-0.16				
				(0.86)				
# of standard					-0.89			
					(1.66)			
INDEPENDENCE								
Perceived independence (WEF)						5.60***		7.16***
						(1.32)		(2.11)
R^2	0.129	0.306	0.088	0.078	0.088	0.338	0.261	0.498
Countries	16	13	17	17	16	17	16	16

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Indicators of the functioning of justice system and the average growth rate (2010-14) of # enterprises

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
# enterprises$_{(2010)}$	-0.59	0.42	-0.02	-0.04	-0.21	0.10	0.50	-0.39
	(0.57)	(0.68)	(0.59)	(0.67)	(0.77)	(0.66)	(0.67)	(0.70)
Efficiency								
Length of proceedings	-4.11**							-3.89**
	(1.11)							(1.33)
Pending cases		-0.81						
		(0.84)						
Quality								
Total spending			-0.05					-0.90
			(1.48)					(0.97)
# of judges				-0.27				
				(1.72)				
# of standard					0.11			
					(2.33)			
Independence								
Perceived independence (WEF)						4.70		3.11
						(2.95)		(3.06)
R^2	0.503	0.045	0.000	0.001	0.006	0.113	0.162	0.540
Countries	17	15	19	19	18	19	18	17

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

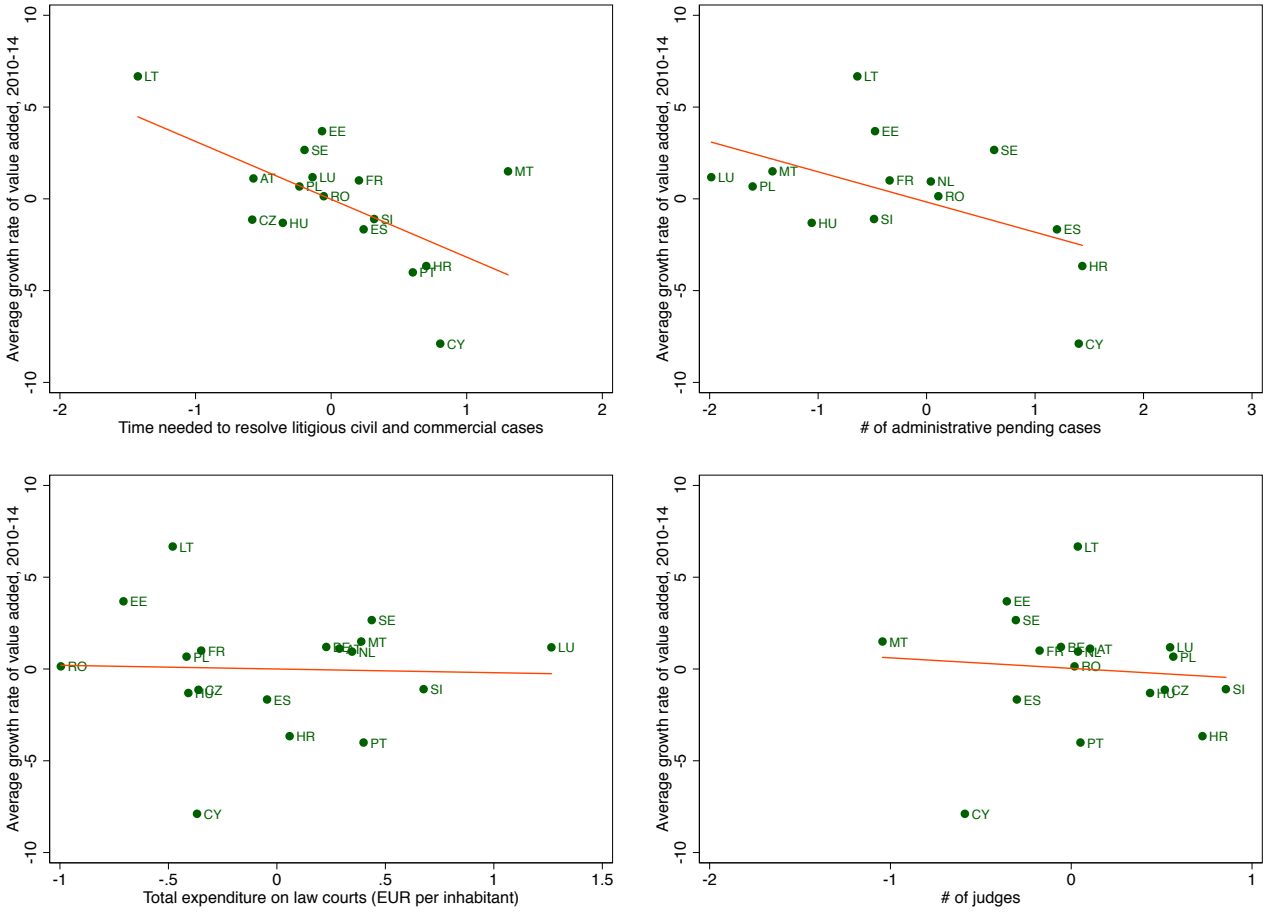

Figure 1: Indicators of the functioning of justice system and the growth rate of value added

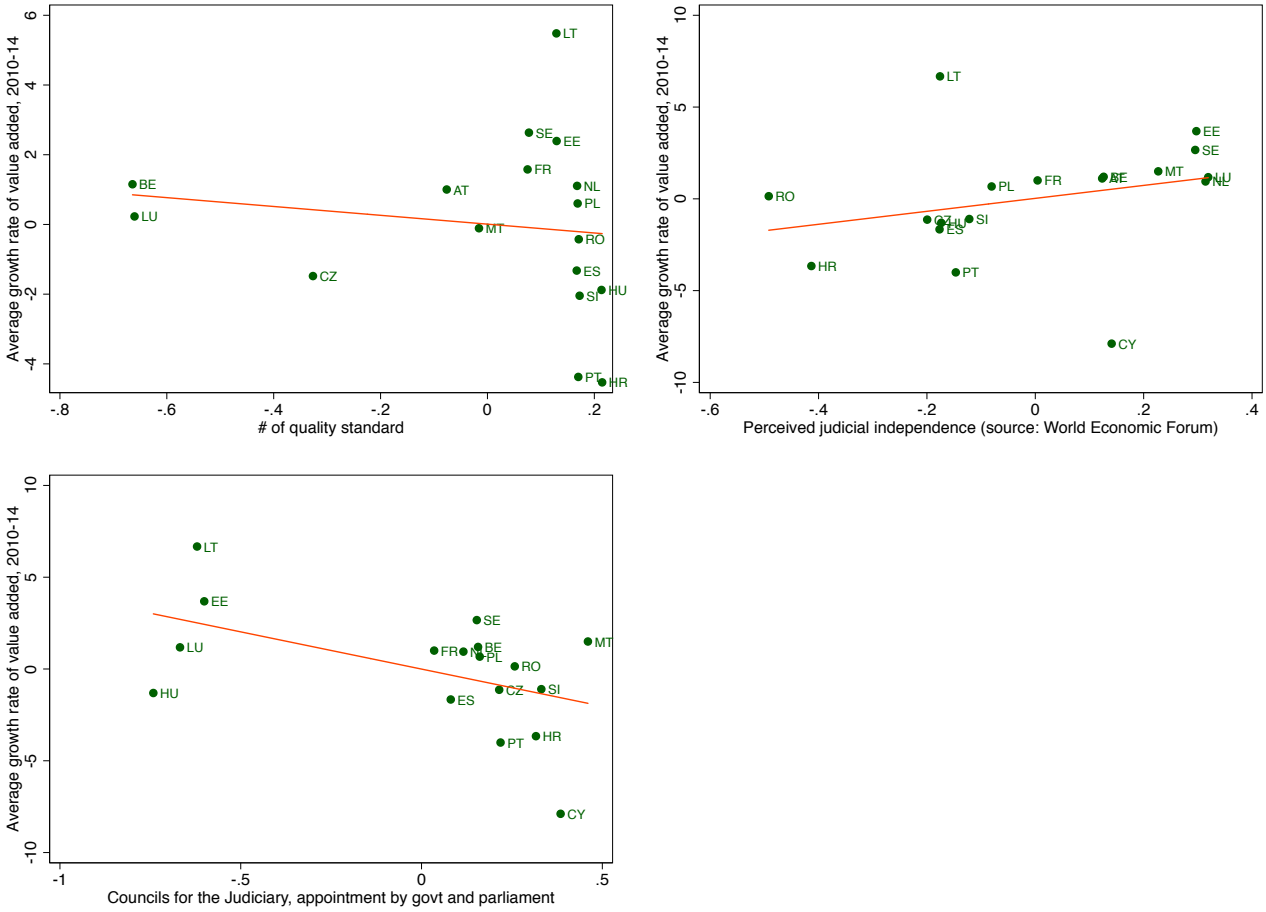

Figure 2: Indicators of the functioning of justice system and the growth rate of value added

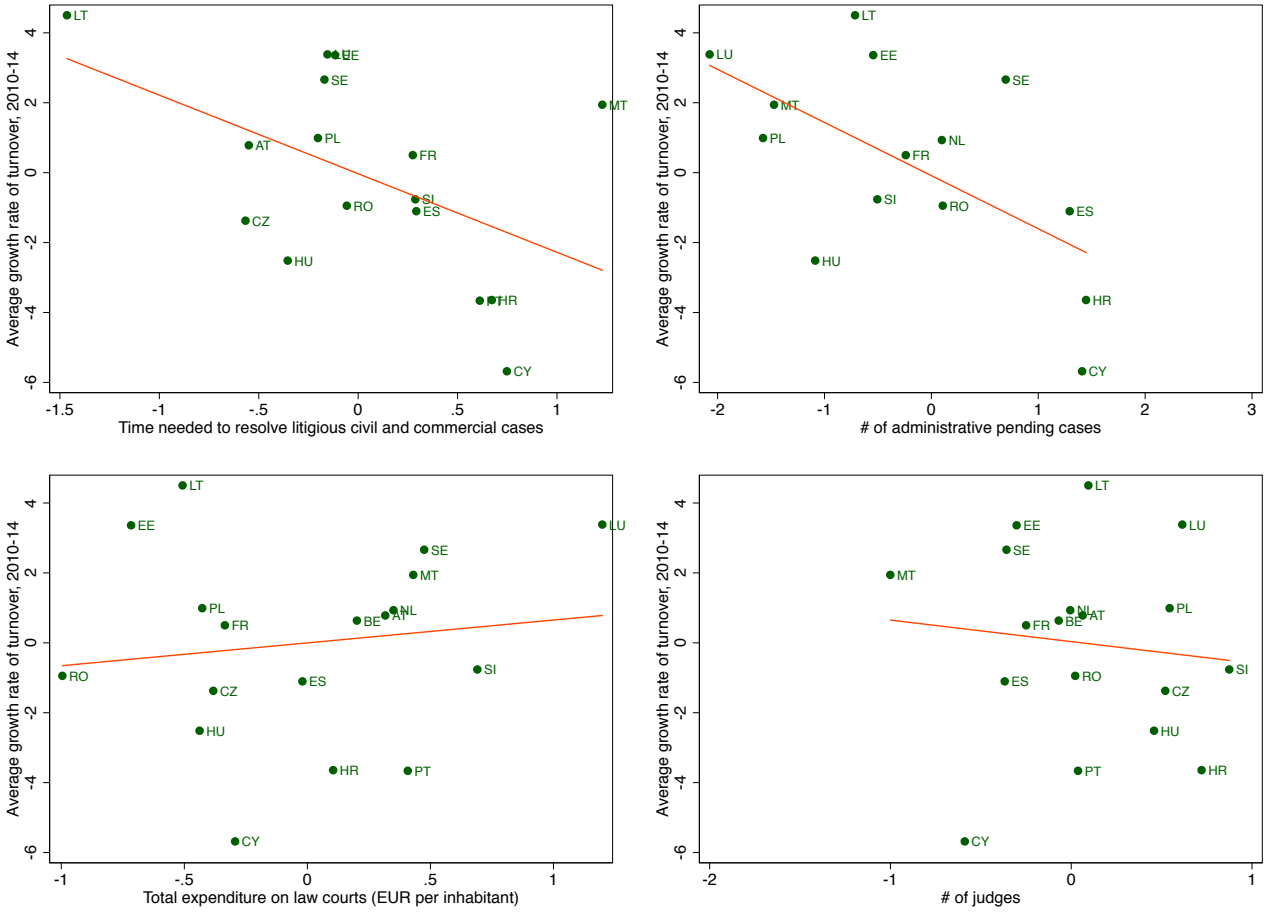

Figure 3: Indicators of the functioning of justice system and the growth rate of turnover

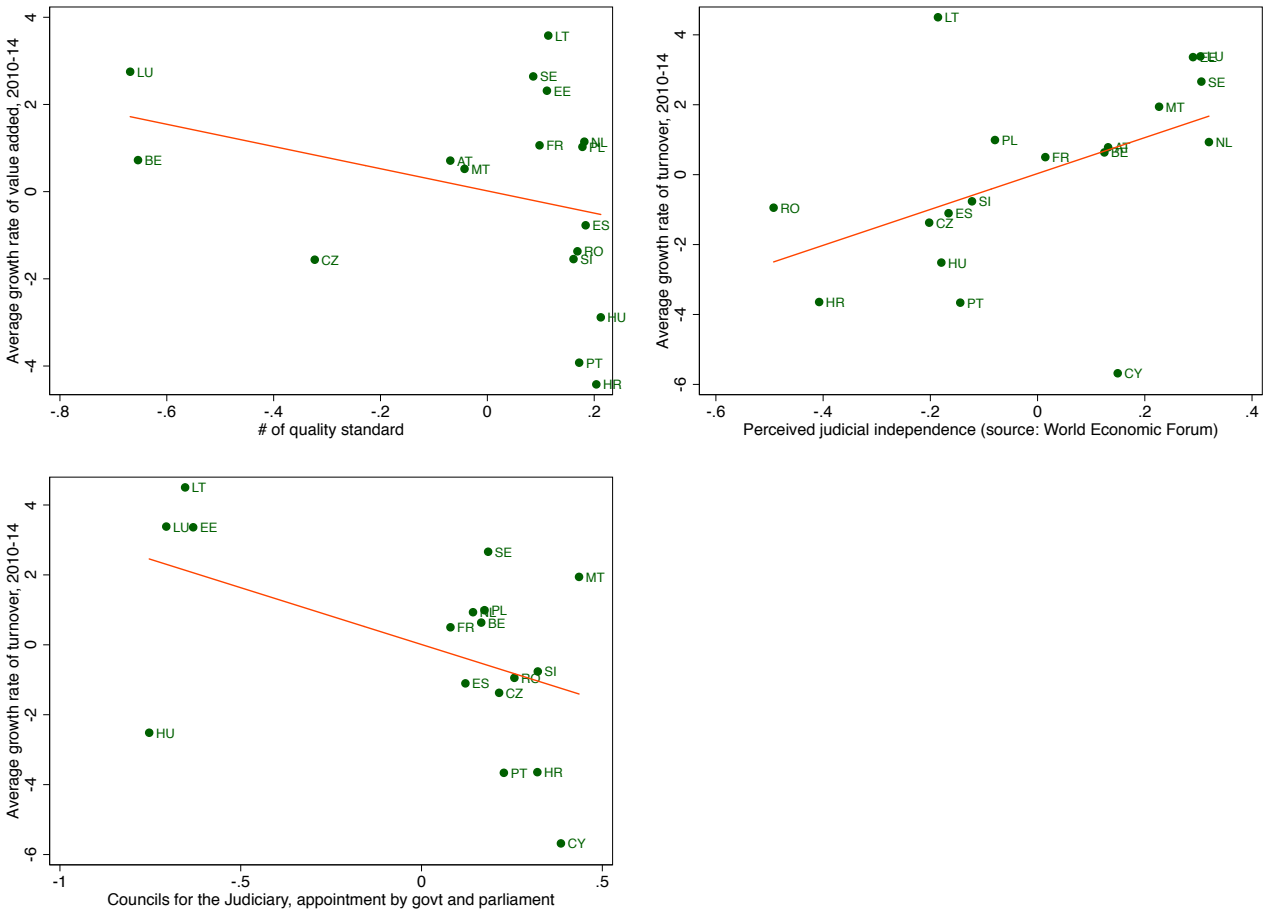

Figure 4: Indicators of the functioning of justice system and the growth rate of turnover

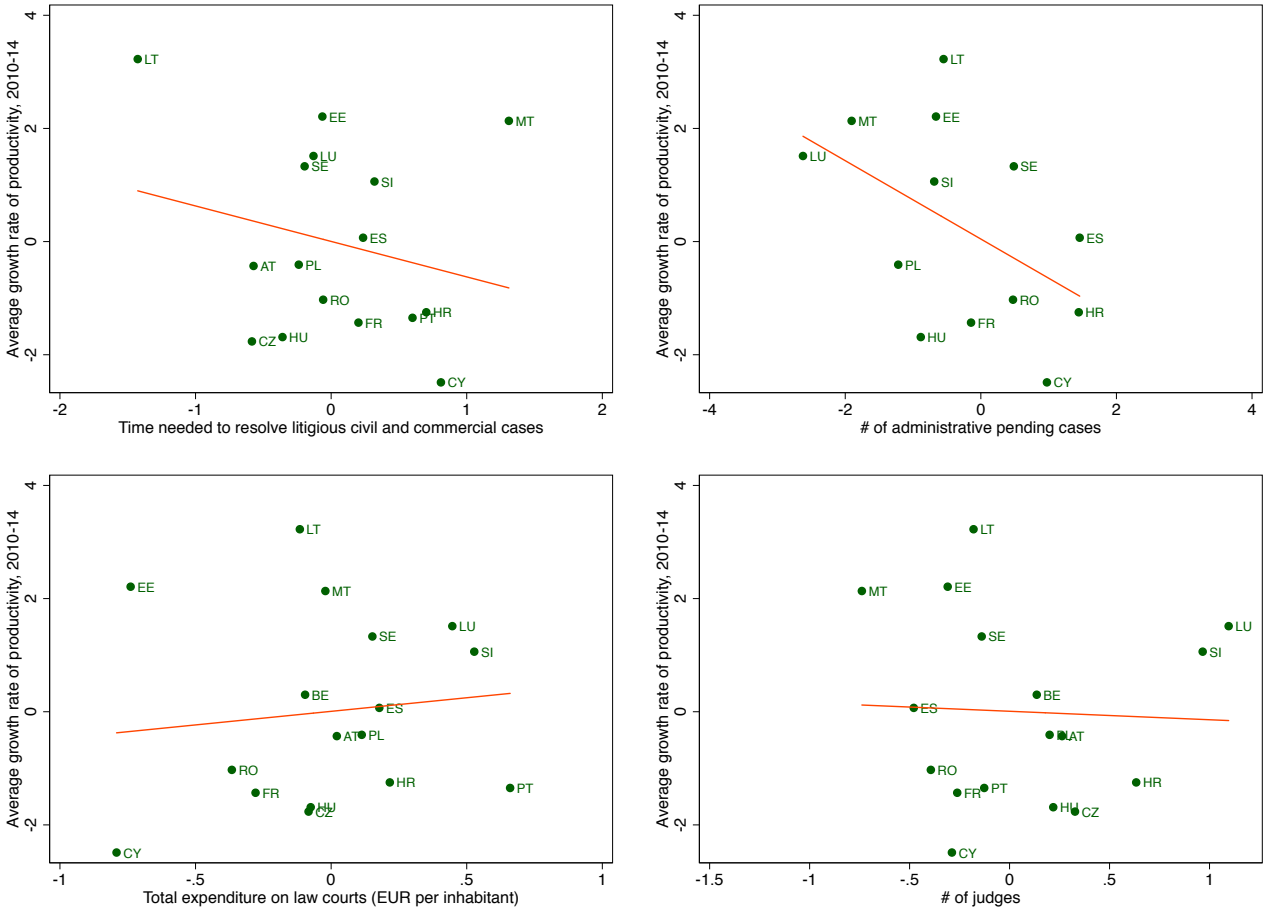

Figure 5: Indicators of the functioning of justice system and the growth rate of productivity

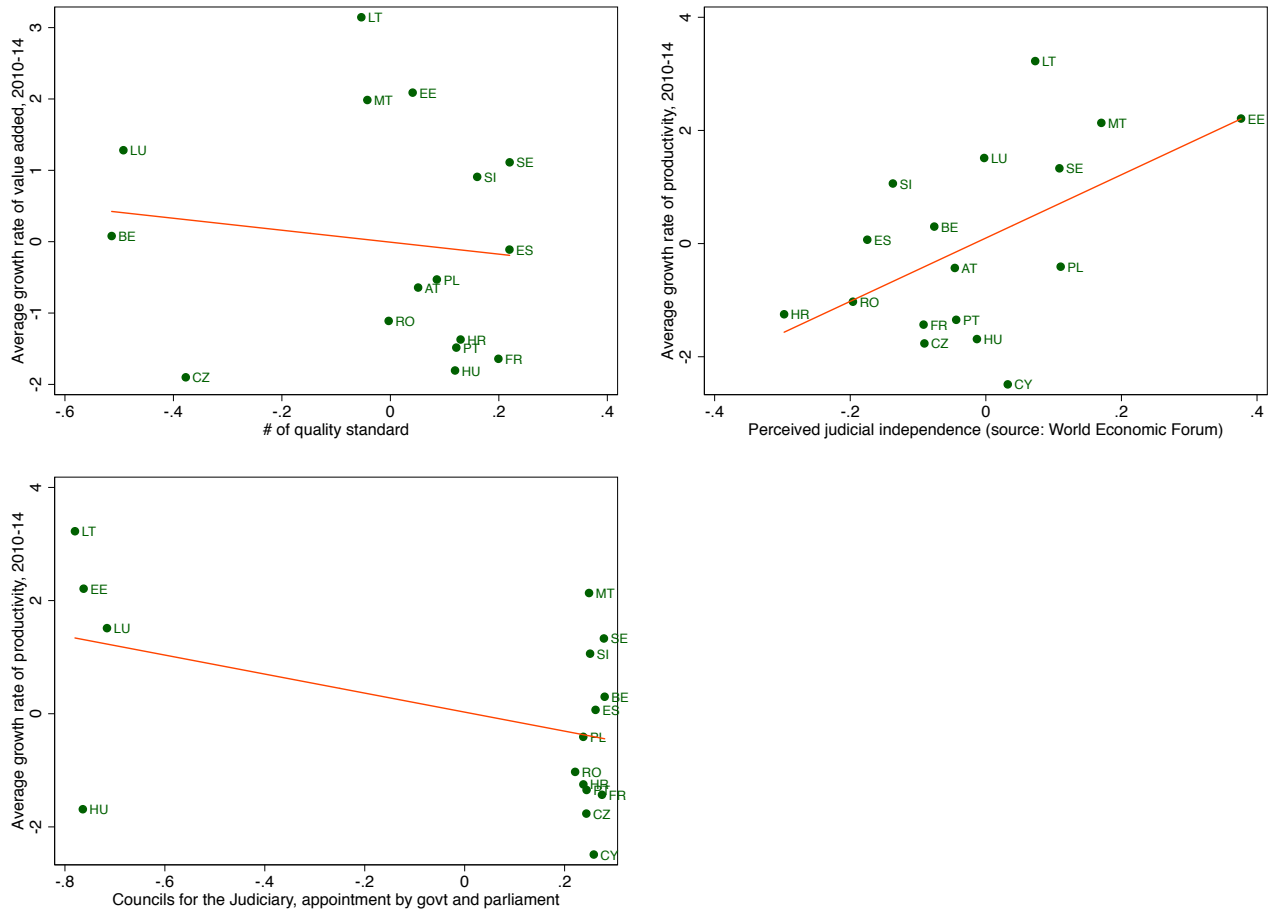

Figure 6: Indicators of the functioning of justice system and the growth rate of productivity

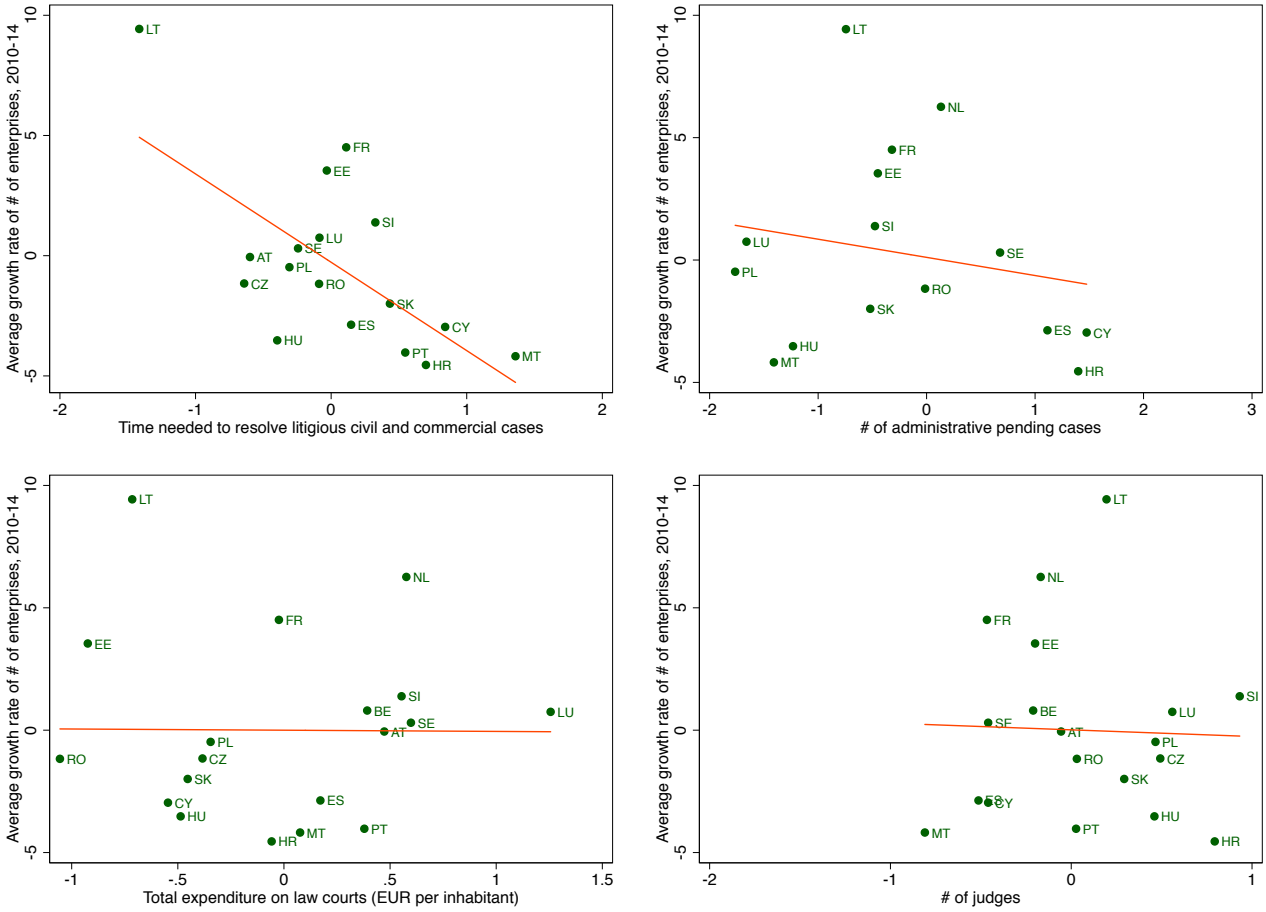

Figure 7: JIndicators of the functioning of justice system and the growth rate of # enterprises

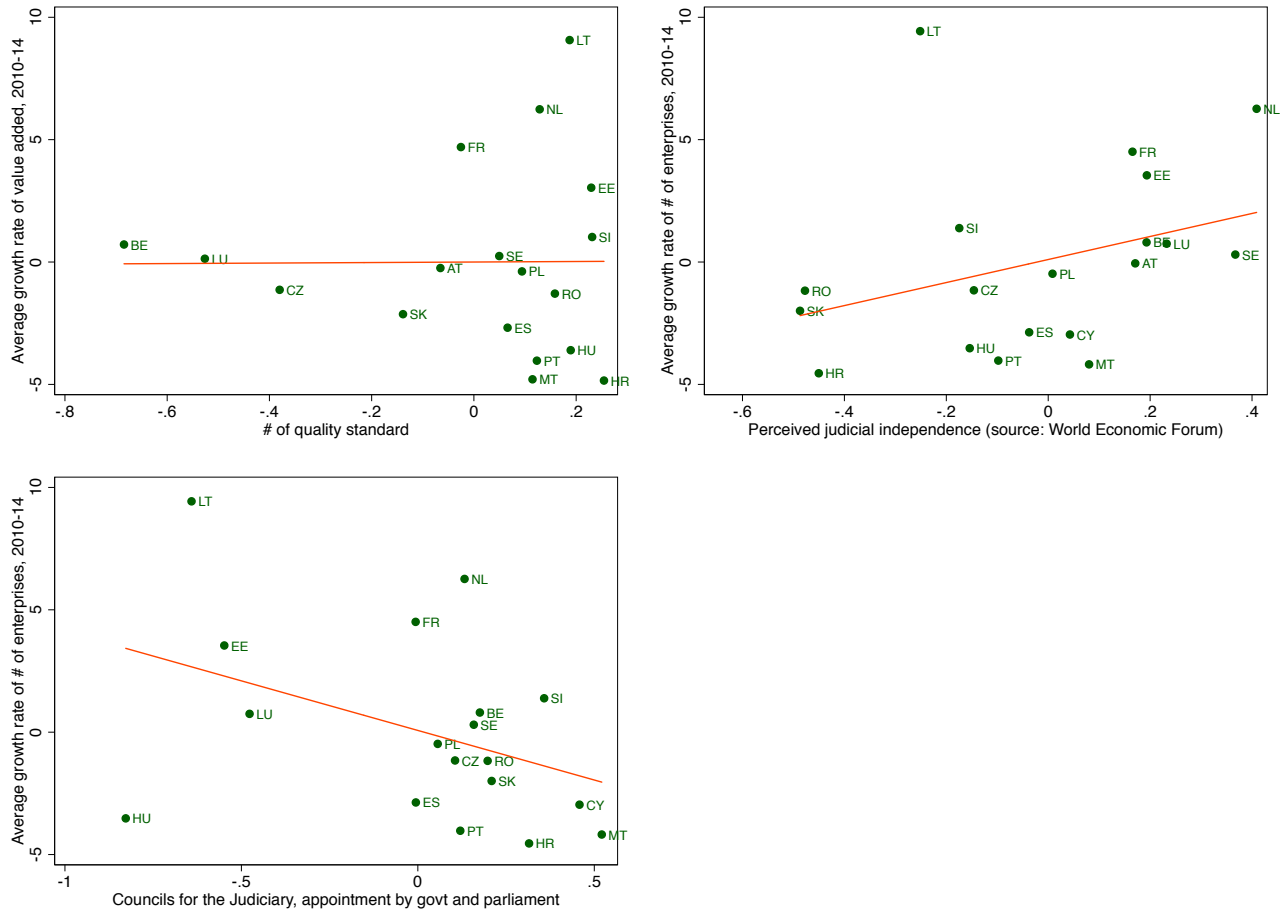

Figure 8: Indicators of the functioning of justice system and the growth rate of # enterprises

Table 5: Robustness check. Indicators of the functioning of justice system and the average growth rate (2010-14) of value added

	(i)	(ii)	(iii)	(iv)	(v)
Value added$_{(2010)}$	-1.36**	0.01	-0.70**	-0.78	-0.86
	(0.46)	(0.57)	(0.29)	(0.53)	(0.56)
Efficiency					
Length of proceedings	-2.16				
	(1.34)				
Δ Length of proceedings	0.34				
	(2.22)				
Pending cases		-1.39			
		(1.63)			
Δ Pending cases		1.58			
		(2.29)			
Quality					
Total spending			1.38		
			(1.02)		
Δ Total spending			10.77**		
			(3.95)		
# of judges				0.00	
				(1.47)	
Δ # of judges				20.28	
				(13.99)	
Independence					
Perceived independence (WEF)					4.82**
					(2.21)
Δ Perceived independence (WEF)					5.03
					(3.79)
R^2	0.591	0.443	0.560	0.309	0.213
Countries	14	13	18	18	18

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Robustness check. Indicators of the functioning of justice system and the average growth rate (2010-14) of turnover

	(i)	(ii)	(iii)	(iv)	(v)
Turnover$_{(2010)}$	-0.86*	0.20	-0.59**	-0.51	-0.60
	(0.46)	(0.45)	(0.23)	(0.41)	(0.47)
EFFICIENCY					
Length of proceedings	-1.93				
	(1.37)				
Δ Length of proceedings	-1.51				
	(2.40)				
Pending cases		-0.91			
		(1.25)			
Δ Pending cases		1.56			
		(1.67)			
QUALITY					
Total spending			2.13**		
			(0.84)		
Δ Total spending			9.68***		
			(2.88)		
# of judges				-0.17	
				(1.25)	
Δ # of judges				16.90	
				(10.59)	
INDEPENDENCE					
Perceived independence (WEF)					6.09***
					(1.93)
Δ Perceived independence (WEF)					3.69
					(3.41)
R^2	0.390	0.401	0.589	0.252	0.285
Countries	14	13	18	18	18

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Robustness check. Indicators of the functioning of justice system and the average growth rate (2010-14) of productivity

	(i)	(ii)	(iii)	(iv)	(v)
Productivity$_{(2010)}$	-0.86	-0.60	-2.23**	-0.75	-2.59**
	(0.79)	(1.03)	(0.90)	(0.74)	(0.92)
Efficiency					
Length of proceedings	-0.70				
	(1.09)				
Δ Length of proceedings	-1.51				
	(2.40)				
Pending cases		0.72			
		(1.16)			
Δ Pending cases		1.56			
		(1.67)			
Quality					
Total spending			2.00**		
			(0.70)		
Δ Total spending			5.04***		
			(1.36)		
# of judges				0.23	
				(0.83)	
Δ # of judges				10.26*	
				(5.10)	
Independence					
Perceived independence (WEF)					5.30***
					(1.56)
Δ Perceived independence (WEF)					-1.20
					(2.98)
R^2	0.165	0.344	0.439	0.243	0.343
Countries	14	12	17	17	17

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Robustness check. Indicators of the functioning of justice system and the average growth rate (2010-14) of # enterprises

	(i)	(ii)	(iii)	(iv)	(v)
# enterprises$_{(2010)}$	-0.94	0.75	0.17	-0.04	0.12
	(0.62)	(0.91)	(0.58)	(0.68)	(0.66)
Efficiency					
Length of proceedings	-3.39**				
	(1.14)				
Δ Length of proceedings	2.82				
	(2.10)				
Pending cases		0.10			
		(1.45)			
Δ Pending cases		2.21			
		(3.17)			
Quality					
Total spending			0.90		
			(1.43)		
Δ Total spending			6.83***		
			(1.84)		
# of judges				-0.22	
				(1.92)	
Δ # of judges				1.73	
				(15.08)	
Independence					
Perceived independence (WEF)					5.30***
					(1.56)
Δ Perceived independence (WEF)					4.99
					(5.06)
R^2	0.490	0.108	0.130	0.002	0.133
Countries	15	14	19	19	19

NOTE. - Ordinary least squares estimates given. A constant is included in every model but not shown. All independent variables are in logs. Standard errors are robust to heteroskedasticity. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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